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# USSR Report

TRANSPORTATION

No. 137

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## RAIL SYSTEMS

### PLAN FOR IMPROVED RAIL SHIPMENT OF GRAIN OUTLINED

Moscow ZHELEZNODOROZHNIY TRANSPORT in Russian No 8, Aug 83 pp 18-23

[Article by E. Yu. Timokhin, candidate of technical sciences: "Providing Safe and Prompt Shipment of Grain"]

[Text] In accordance with the national economic goals set by the USSR Food Program, the shipment of cargo to meet agricultural needs and the transport of agricultural products will be growing steadily. In order to achieve these goals, it is necessary to take measures to improve transportation services for sectors of the agro-industrial complex, and to improve the protection of agricultural products during storage and rail transport.

Grain and milling products account for the largest share of the agricultural products shipped by rail. Therefore, improving the quality of grain shipments is of the utmost importance. This can be achieved only by making more efficient use of the fleet of all-purpose boxcars and grain hoppers; this means that layovers must be reduced not only during the actual loading and unloading, but also when cars are waiting for loading operations to be carried out, for development of express shipments and accelerated forwarding of outgoing express trains, for improved planning of shipping operations, and so on. The railroads do not always manage to fulfill the plans for grain shipments; there are problems in the repair of rolling stock; and not enough repaired boxcars are sent to grain-hauling railroads.

A number of problems must be solved if grain is to be received regularly for shipment: the rate and quality of readying the necessary quantity of rolling stock must be increased; the existing system for planning freight shipments, including express shipments, must be improved; the technical materials-handling equipment of both the dispatchers and consignees must be improved; and so on. In other words, the optimal technological process for shipping grain must be realized.

#### The Structure of Shipments and Organizing Express Routes

The volume of grain shipments is determined by the size of the harvest. Consumers are assigned to various production regions depending on the grain quality and the length of time involved in the grain ripening. If the inter-regional exchange of milling products is fairly stable, then transport

connections for grain shipments change depending on the geography of the harvest.

On the whole, the basic flows of grain shipments are in a specific direction. It is well known that grain from the Volga region, Kazakhstan, the Urals, and Siberia goes to the European part of the country and to Central Asia; grain from the Northern Caucasus and the Ukraine goes to the central and northwestern regions; and the Far East receives grain primarily from Siberia.

The main grain carriers are the Southern, Southwestern, Volga, and Kazakhstan Railroads. The Tselin Railroad carries 12-14 percent of the average daily shipments carried by all the railroads; the North Caucasus Railroad carries 10-12 percent; the South Urals Railroad carries 8-10 percent; and the Volga Railroad carries 6-8 percent.

Grain shipments are characterized by significant irregularities in terms of routes and months. They increase sharply between August and October during the harvest period; they drop off somewhat during the subsequent period, when mainly flour products are being shipped and redistributed among grain storage facilities, and grain is shipped from the remote elevators. During the spring months there is an increase in the shipment of grain for the sowing campaign and in May the volume of shipments begins to drop off, reaching its minimum during the summer months.

An analysis of the nature of monthly changes in the volume of grain shipments between 1956 and 1960 and between 1978 and 1982 showed a decrease in the irregularity of the shipments. During the earlier period the volume of shipments during the month of maximum activity exceeded the average monthly level by 55-60 percent; now it exceeds the average by less than 40 percent. In addition, compared to the earlier period there was an increase in the shipment of grain during the first quarter.

The trend toward evening out the irregularities in grain shipments can be explained to a great extent by the development of more warehouse facilities. Considering the increasing shipments of grain, however, it is necessary to devote greater attention to more efficient utilization of existing elevators and warehouses in the grain-producing regions, and to building new ones fitted with the proper technical equipment. Because of a lack of equipment for drying grain at many procurement centers, it is necessary to ship grain to other centers for drying, which are often a short distance away; and then the grain has to be transported back in the opposite direction.

Along with making these shipments in opposite directions and occupying the railroad sections' carrying capacities, problems arise in preparing a large fleet of boxcars in a short period of time for stepped-up grain shipments.

During the harvest period, the volume of grain shipments increases significantly compared to the average annual levels; in August and September it is necessary to reserve an especially large number of boxcars for grain shipments. In June and July the volume of grain shipments decreases by 25-45 percent. On the Tselin, North Caucasus, South Urals, and West Siberian

Railroads, the range of fluctuations in the volume of grain shipments is quite large.

In addition to this, the periods of rises and falls in shipments differ by region and by year; this can be explained to a considerable extent by the variations in the time required for the crops to ripen. When the harvest periods coincide fairly closely in certain years due to similar weather conditions in the North Caucasus, the Volga region, and Kazakhstan, there is a sharp increase in the demand for boxcars. This makes it difficult not only to ready the boxcars for shipments, but it also complicates the movement of trains along the heavily travelled routes.

A study of the reasons for the fluctuations in shipments showed that they are tied primarily to the seasonal nature of production in a number of sectors of the national economy. The greatest irregularities are seen in the shipment of agricultural products. Over 80 percent of the year's shipments of potatoes and vegetables are made in August and September; the shipment of sugar beets and raw sugar is carried out over a period of 5 months. During the intensive harvest campaign, in addition to the rise in grain shipments, there is an increase in the movement of motor vehicles and agricultural machinery among various parts of the country. At the same time there is an increase in the shipments of coal and other types of fuel in order to build up winter stocks for industry and transportation.

Express shipments of freight, including grain, take on great importance under the intensive working conditions at sorting yards and along railroad sections that are used for moving the higher flow of trains during the high-activity months. Express shipments make it possible to relieve the sorting yards of some of the processing of the extra flow of railcars and to speed up the railcar turn-around time, while decreasing the shortage of boxcars, for example, used for shipping grain.

It is well known that setting up express shipments of freight from the initial loading point is one of the most efficient methods for speeding up railcar turn-around time. Express shipments provide a reduction in the processing of railcars at technical stations along the route. This is very important in increasing the protection of grain during railway transport.

The experience of using all-purpose boxcars for grain shipments, and the experiments conducted by the Tselin Railroad, showed that the shaking of the railcar caused by the movement of the train, and especially that caused by railcars hitting each other as trains are being broken up in the switchyard, results in the grain scattering all around the car and then leaking out through the upper edge of the grain shield. Therefore, a reduction in the uncoupling and uncoupling of cars loaded with grain when they are following a dispatcher express route, and not a technical route, will help decrease losses of grain.

The average level of express shipments of grain in the network in recent years has been 10-14 percent. The Tselin and North Caucasus Railroads form the most express grain shipments. There is a significant increase in the number of express shipments during the harvest season; during this period more than 60

percent of the shipments on the Tselin Railroad, for example, are express shipments.

An increase in the level of express shipments is made more difficult by the widely scattered destinations of the grain shipments. An analysis of the monthly plans that several railroads have developed for grain shipments revealed that an average of 10 railroads in the network have commercial relations with each grain-loading station. Certain stations have commercial ties with more than 20 railroads. The Tselin Railroad, for example, makes grain shipments year-round and wheat accounts for about 90 percent of the shipments at all the railroad's stations. Of the railroad's 109 stations involved in grain shipments, 94 ship grain to the Central Asian Railroad; 85 ship to the Alma-Ata Railroad; 76 ship to the Southwestern Railroad; 74 ship to the Moscow Railroad; and so on<sup>1</sup>.

Developing an efficient system for assigning grain-loading stations to consumption regions that is specialized in terms of various types of grain crops would not only increase the number of express shipments, it would also make it possible to reduce the number of shipments of one type of grain made in opposite directions within the railroads. Currently a number of grain-hauling railroads make quite a large number of shipments of this type; on heavily travelled routes this leads to unwarranted losses in the movement of the train flows.

Grain is shipped by both express and local routes. In the network an average of 36-40 percent of the annual grain shipments are carried on express routes. During the harvest season there is an increase in the proportion of express shipments in comparison to local routes. On the Tselin Railroad 50-58 percent of all the grain shipments during the intensive harvest campaign are made on express routes; of these 20-30 percent are sent to just one unloading station, and the rest of the grain is carried on local routes. During the harvest season the Volga Railroad carries 95-97 percent of its grain shipments on express routes, and only 3-5 percent on local routes. This situation is influenced by the geographical position of the railroad, the scattered arrangement of the mass grain loading sections, and the technical equipment available at the loading and unloading points.

An analysis of the fulfillment of quotas for express shipments of grain showed that the plan is being met by an average of 67-70 percent throughout the network. About 53-55 percent of all the cases involving failure to fulfill the quotas are the fault of the railroad, and 45-47 percent are the fault of the dispatcher. There are two main reasons for this. The first reason is that sometimes there is an unwarranted overestimate of the dispatchers' requests for rolling stock. When these requests are fully met, especially when hopper cars are provided for the grain loading, there is often a failure to provide the amount of grain required to fill the cars. This results in a disruption of the plan for express shipments. The second reason is the current practice of making corrections in grain shipment plans while the operations are being carried out. If one compares the plans for express grain shipments with what is actually being done, there are significant discrepancies. A railroad makes express shipments of grain primarily to the nearest towns. Actually, express shipments can be made to any railroad in the network.

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\*cf. ZHELEZNODOROZHNYI TRANSPORT, No 8, 1982

The September 1981 plan called for the Tselin Railroad to make express grain shipments to 8 railroads; it actually made shipments to 15 railroads. According to the plan, 63 percent of the express grain shipments were supposed to follow routes that included unloading at just one station; only 37 percent involved widely scattered routes. The actual express shipments of grain exceeded the plan by a factor of 2.5. Only about 40 percent of all the express grain shipments involved unloading at just one station.

When plans for express grain shipments are not met and it is the fault of the railroad, it is most often because the grain dispatchers have not been provided with enough rolling stock that is suitable for carrying grain. Therefore, the problem of organizing high quality preparation of railcars for carrying grain is of special importance today.

#### Preparation of Loading Resources

An important condition for the rapid and safe shipment of grain is the adequate delivery of rolling stock to all grain-loading points. The formation of loading resources for shipping grain depends on railcars that have been freed up after being unloaded, and those that arrive at the grain-hauling railroad according to regulation quotas. Many of the empty boxcars that are to be used for grain shipments are in need of preparation. The labor-intensiveness of this work depends on the technical and commercial condition of the cars, on the existing system for regulating empty railcars, and on the geographical location of the grain-hauling railroad.

An analysis of the condition of empty boxcars showed that many of them arrive at the grain-hauling railroads with damaged flooring, damaged end walls, and without doors. It is very difficult to open many of the cars that have damaged doors, which can ruin the panels on the cars.

There is an especially serious problem involving the removal of remnants of cargo that was last carried in the car. Special tracks for cleaning cars need to be built or set aside at the stations; and considerable material and manpower resources must be expended. These expenditures are significantly higher than those required for organizing a strict system of control over utilization of the railcars by dispatchers and consignees, and for taking effective measures to put an end to their violations of the requirements in Paragraph 51 of the USSR Railways Charter. The nature of the commercial and technical defects is such that some railroads are not able to handle all the necessary repairs on boxcars because their preparation points are not adequately developed. This causes problems with loading resources during the harvest season.

The level of development at many centers for preparing boxcars falls short of current demands. A considerable amount of the work is done manually, including washing the railcars. This factor and the inadequate supply of various pneumatic and electrical equipment, the absence of a flow-line production system, and the seasonal nature of the work at a number of the centers for preparing boxcars for carrying grain all reduce the operations to an elementary adaptation of each railcar for making a single grain shipment.



The problem of creating large mechanized railcar preparation centers is not as urgent at the grain-hauling railroads that are delivering empty cars according to the regulation quotas. These railroads are able to select empty rolling stock that is in good technical and commercial condition, or that needs only minor repair or cleaning, to be sent on to other railroads for shipping grain.

A different situation exists at railroads that only receive empty boxcars. The lack of technical possibilities for putting the required number of cars into the proper condition for carrying grain and an increase in the number of empty boxcars that arrive under the regulation quota and are in need of major repairs are the primary reasons behind these railroads' delivering unrepaired empty boxcars to neighboring railroads and violating the established regulation system. This leads not only to additional expenditures due to opposite, empty runs of a certain type of rolling stock, but also to unrecoverable losses in traffic and carrying capacities, especially on the heavily travelled routes.

Under conditions of inadequate technical possibilities for preparing rolling stock for carrying grain at various grain-hauling railroads during mass shipment periods, the railcar preparation centers at other railroads that are not being fully utilized can be of significant assistance. It would seem that using these reserves for sending to railroads the so-called "reserved" express trains of empty boxcars that have been prepared for carrying grain would remove some of the urgency of the problem of providing grain-hauling railroads with loading resources. In practice, however, the desired effect from these routes is not always achieved.

An analysis of the technical and commercial condition of boxcars that arrive as part of the "reserved" express trains at various grain-hauling railroads showed that 8-10 percent of the cars were suitable for carrying grain; 45-50 percent needed minor repairs and cleaning, after which they could be used for carrying grain. The remaining 40-47 percent were in need of major repairs or were totally unsuitable for carrying grain.

In order to increase the efficiency of the system for organizing the "reserved" express trains, the suggestions made by a number of specialists should be utilized: the shipping documents for these trains should be supplemented by papers indicating the technical condition of the cars, verified by the workers who prepared the cars for carrying grain. In addition to increased responsibility for sending out rolling stock that is unsuitable for carrying grain, this kind of record would make it possible to eliminate uncontrolled removal of cars suitable for carrying grain from the "reserved" express train, accompanied by delivery of unsuitable rolling stock.

With the limited technical opportunities for preparing boxcars for carrying grain at various grain-hauling railroads, dispatchers can provide an uninterrupted supply of loading resources for the sharp increase in shipments during the harvest period by creating reserve railcar fleets. The existing system for prompt preparation of cars for carrying grain is directed at meeting the initial rate of loading the seasonal cargo, which includes grain. This reserve is created by maintaining the surplus of railcars with a decrease in the working fleet on railroads and the arrival of newly-built cars and those that have undergone planned repairs.

An analysis of the utilization of boxcars from the reserve during the harvest period showed that some of the cars are rejected by representatives of the State Grain Inspectorate as unsuitable for carrying grain when they arrive at the grain loading centers. This is tied to poor preparation of individual railcars and damage to rolling stock that is held in reserve, which indicates that there is a need to improve the system for retaining and maintaining the cars that are in the reserve fleet. Boxcars are often held in reserve that have not undergone the preliminary preparations for carrying cargo. When these cars are removed from the reserve, it is usually necessary to send them to a railcar preparation center, and then they are sent in the opposite direction to be used for hauling grain.

In our opinion, in order to increase the efficiency of the preliminary preparation of boxcars and keeping them in reserve during the pre-harvest period, it would be wise to organize special selection of boxcars. The suitability of the car for carrying grain should be verified by a representative of the State Grain Inspectorate in an appropriate document. After being prepared for carrying grain, the car should be held in reserve and the State Grain Inspectorate seal should be affixed to the lock.

The serious problems being experienced by various railroads in supplying suitable rolling stock for higher rates of grain shipments, when a significant proportion of the grain needs to be dried and there is not enough grain-drying equipment, can be reduced by increasing the size of the boxcar reserves that are readied in time for shipping the grain. An analysis of the utilization of the fleet of all-purpose boxcars, however, shows that the greatest demand for this type of rolling stock occurs during the period between August and November. Mass shipments of grain from the new harvest are made during these months. The size of the boxcar fleet that remains in reserve during this period is totally inadequate as a source for increasing the number of railcars that have undergone preliminary preparations for carrying grain and brought out of reserve to meet the needs for the entire period of intensive grain shipment. It is obvious that in order to increase the supply of boxcars to grain-hauling railroads during the intensive harvest period, there should be an increase in the list of cargo shipments excluded from the plan, the consumption of which drops off during the fall and winter seasons.

The rate of grain shipments made by railroads is determined by the technical possibilities and the situation involving the shipment of other cargo in all-purpose boxcars. Practice shows that in various oblasts with free warehouse facilities, and consequently possibilities for more regular shipment of grain during the post-harvest period, there are still instances of accelerated delivery of grain for shipment. At the same time, other railroads that have inadequate warehousing services and problems with providing loading resources, grain is often stored in facilities that are poorly adapted for this purpose. In our opinion, it is necessary to rationalize the existing system for planning grain shipments by procurers, with the aim of eliminating the problems in shipping not only grain, but also other cargo transported in boxcars.

## Utilization of Specialized Rolling Stock

An analysis of the utilization of boxcars from the reserve during the harvest period showed that some of the cars are rejected by representatives of the State Grain Inspectorate as unsuitable for carrying grain when they arrive at the grain loading centers. This is tied to poor preparation of individual railcars and damage to rolling stock that is held in reserve, which indicates that there is a need to improve the system for retaining and maintaining the cars that are in the reserve fleet. Boxcars are often held in reserve that have not undergone the preliminary preparations for carrying cargo. When these cars are removed from the reserve, it is usually necessary to send them to a railcar preparation center, and then they are sent in the opposite direction to be used for hauling grain.

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## Utilization of Specialized Rolling Stock

Under the conditions of the intensive work being done to provide grain-hauling railroads with suitable rolling stock, the increased shipment of cargo in specialized rolling stock is an important reserve. With this aim, the fleet of special hopper cars in the network is enlarged every year. Using cars of this type makes it possible to decrease the layover time needed to perform operations tied to preparing the cars for carrying grain, as well as the time needed for the grain inspectorate staff to examine the cars, sorting the in-coming cars into groups suitable and unsuitable for carrying grain, and equipping them with grain shields.

The practice of organizing grain shipments in hopper cars on the October, Baltic, Odessa, North Caucasus, Tselin, and South Urals Railroads showed that this specialized rolling stock is organized primarily in dispatch express routes. The shipment of grain in small groups of hopper cars occurs, as a rule, within the railroads; it occurs less frequently within the boundaries of two railroads. In order to decrease the empty runs of specialized rolling stock, the traffic of express trains is organized in a "circular" route on a number of railroads.

The network's experience of using hopper cars to make grain shipments shows that the technical possibilities of this promising type of rolling stock are not being fully utilized at unloading points. The existing "Norms for Technological Planning of Grain Procurement Enterprises and Elevators", confirmed by the USSR Ministry of Procurement, do not contain requirements for the equipment needed to unload grain from the hopper cars. The practical consequence of this is that often the receiving equipment located in the space between the rails can accommodate no more than 7-10 tons of grain. Because of this, when unloading hopper cars it is necessary periodically to close the unloading hatches. When there is a low-productivity bucket conveyor, this can increase the unloading time from 10 minutes to 1-2 hours; and when the loading center has a small capacity, this can also cause significant unloading layovers for a group of cars or entire express trains.

The unloading centers at many grain-receiving enterprises can receive 2-3 railcars at a time. The small capacity and low productivity of these centers are flaws in the receiving equipment. Therefore the duration of the unloading operations for a hopper car increases by a factor of 10 or more over its structural possibilities. In addition, not even all the large grain receivers have equipment for unloading the hopper cars; and the vagueness in establishing time norms for unloading express trains does not stimulate the consignees to improve the technical equipment of the loading centers.

Norms need to be established for the planning and redesign of equipment used to unload grain from these cars that arrive in groups or in express trains.

Furthermore, express trains made up of hopper cars are often unloaded at several stations. This leads to significant layovers as the cars are waiting for the train to be made up from stations in the junction, section, or several sections.

In order to eliminate express train layovers at unloading stations while they are waiting for loading stations to be freed up, it is necessary to improve the planning of grain shipments. First of all, the lack of correspondence between the rate at which grain express trains are sent to certain unloading stations and the technical possibilities of the consignees must be eliminated. Often 2-3 express trains are sent to one unloading station at 3-8 hour intervals; this can lead to railcar layover of several days while they are waiting to be unloaded and the trains that arrived earlier are cleaned, or while they are waiting to be rerouted to another unloading station. It must be noted that the absence of timely information on whether the consignees' unloading centers are occupied, and on the approach of grain-carrying trains to the unloading stations leads to unwarranted losses of loading resources, especially during the intensive harvest period.

By the end of the 1980s the fleet of specialized railcars will include a significant number of hopper cars for carrying grain. Trains made up of these cars cannot be unloaded at all stations, even those that receive a large volume of grain for storage or processing. There are several hundred stations included on the existing list of stations at which the elevators, transfer points, grain depots, milling plants, mixed feed plants, and other grain-receiving enterprises can receive and unload express trains carrying grain. About 40 percent of the stations can unload trains consisting only of all-purpose boxcars; about 15 percent can unload trains consisting only of hopper cars; the rest unload trains consisting of both types of rolling stock.

The technical equipment and track development of these consignees do not permit unloading of the grain within economically efficient time periods. The proportion of enterprises capable of loading grain carriers (or boxcars through roof hatches) is small; and among the overwhelming majority of dispatchers that are able to load grain through hatches in the railcar roof, the productivity of the equipment is too low. The capacity of loading centers for simultaneous unloading operations is inadequate, as is their technical equipment.

The development of loading centers taking into account requirements for intensifying utilization of the rolling stock is an important reserve for reducing railcar layovers during the loading and unloading of grain. Fuller utilization of this reserve can be promoted by providing loading centers with equipment for weighing railcars during the loading process. This makes it possible to cut down unproductive time spent on shunting operations.

#### Cooperation Among Different Forms of Transport

A great deal also depends on improving the organization of grain unloading at maritime ports. Over the last 10 years some highly productive vessels have been added to the maritime shipping fleet; the ports' material base has been strengthened; the system for managing all the links in maritime transport has been improved. All-weather complexes have appeared at ports, making it possible to carry out regular transfer of grain and raw sugar.

The results of the ports' work, however, often fall short of planned goals. One of the objective reasons for this is that the rate of growth in the fleet and port capacities exceeds the technical development of the railroad stations

and subdivisions adjacent to the ports that provide transfer of cargo to rolling stock that is in suitable commercial and technical condition.

The insufficient length and number of receiving and forwarding tracks at various port stations are delaying broad implementation of express grain shipments. When organizing express forwarding of cargo, it is necessary to spend additional time on forming an express train with a specific destination. Therefore, when there is a shortage of tracks, an effort is made to send the cars in trains that must be sorted, and not in express forwarding trains.

Track development at a number of railroad stations adjacent to ports does not meet the increased demand for transfer operations; this fact, together with the limited possibilities for expanding the tracks due to a lack of unoccupied territory around the station make it difficult to weigh the railcars. Under these conditions, the volume of shunting operations at the port stations themselves can be reduced by weighing the railcars' packing materials at the approaches to the ports. Erecting weighing equipment with the necessary track development will make it possible to optimize this process. The level of development of the weighing services and the advisability of doing the weighing at approaches to the ports should be assessed, taking into account a future increase in the fleet of specialized cars for shipping grain. With an increase in the fleet of grain-carrying hopper cars, it will be possible to eliminate totally the need to weigh packing materials, after the various technological problems have been resolved.

Railroad transport suffers significant and unwarranted losses as a result of opposite shipments of a single type of grain cargo. For example, it often happens that grain cargo between the Odessa port and the Dnepr and Donetsk Railroads is shipped in the opposite direction of grain cargo travelling between Feodosiya and the Odessa and Moldavian Railroads.

The opportunities provided by the river fleet are not fully utilized in the organization of grain transfers. The availability of vessels that are able to enter maritime ports and then carry freight by river into remote parts of the country makes it possible to switch grain shipments from railroads to the river fleet during the navigation season and to free up the railcar fleet and the tracks' carrying capacities for shipping other national economic freight. A great deal of grain is shipped between the Novorossiysk port and regions located along and near the Volga River. Taking into account the large loads carried along grain-hauling routes, it would be wise to transfer these shipments to the river fleet as well.

Bringing the level of technical development of port railroad stations and loading centers into correspondence with requirements for optimizing the port's and station's technological processes is an important task. A certain amount of time is needed to fulfill this goal, however. In order to improve the quality of grain shipments today it is necessary to increase the express shipments of grain on railroads between ports and the country's economic regions, and the express trains must be returned after the shipments are made.

Improving the organization of grain shipments is an important issue. First of all, considering the problems involving the preparation of boxcars during the

harvest period and the inadequate hopper car fleet, it would be wise to increase the number of shipments made in "circular" routes. The nature of the flow of empty railcars within the network is such that along various polygons the shipment of grain can be organized in a circular manner. The utilization of circular routes for express trains made up of hopper cars confirmed the possibility of setting up strict control over their movement.

According to the circulation conditions, express trains can be circular or industrial; industrial trains have been used extensively in shipping coal to major consignees. Unlike the circular express trains, which are returned empty to the original railroad after they have been unloaded, without any changes in the composition of the train, the industrial trains can be returned with "altered" rolling stock. In this case the unloading station sends an empty train made up of one type of rolling stock to the loading station; these cars can be used to ship another kind of cargo, but they need to be prepared before being loaded again.

Trains of this type are not used extensively when grain shipments are being organized because in the majority of cases the unloading stations do not have centers for preparing all-purpose boxcars for carrying grain or the centers do not have the sufficient capacity. The size of the hopper car fleet for carrying grain still does not allow for organizing the cars into industrial trains. Furthermore, many stations receive no more than 1-2 express trains of grain a month; this also does not provide the necessary conditions for using industrial express trains.

Considering the fact that less than 50 percent of all grain shipped on express trains is shipped on direct express routes, it seems wise to plan the loading of circular trains so that the unloading can be done at stations located within the limits of the turnover section of a combined train. The order in which railcars are arranged in an express train and the order in which they are addressed should correspond to the geographical location of the unloading stations and the order in which cars are uncoupled from the train along the section. This will make it possible to eliminate the need to reform the train before it reaches its unloading section. The formation of railcars into a train after grain has been unloaded must be done by a locomotive sent especially for that purpose or by a single combined train.

This system for organizing the unloading of a grain-hauling express train at a section makes it possible to speed up the turn-around time significantly and to reduce the amount of railcar processing at section or sorting stations, by eliminating the need to reform a train before it reaches the unloading section.

It is necessary to include repaired railcars with self-packing doors in the fleet of specialized railcars that are to be used to form circular express routes. In our opinion, the bodies of railcars that have been assigned to a grain-hauling railroad should be painted in a different color than other all-purpose boxcars and they should have the appropriate stencil and numbers displayed.

At the first stage it seems wise to organize circulation of these express trains along various polygons of the railroads. The first polybon would be

formed by the Odessa, Dnepr, Southern, and Southwestern Railroads. About 70 percent of the grain carried on these railroads is unloaded at stations along the polygon. The organization of circular routes for shipping grain between the Odessa Railroad and neighboring railroads will not result in any opposite runs of empty boxcars. A similar approach is being taken to selecting the second polygon for the circulation of circular express trains made up of all-purpose boxcars. It will be between the October, Baltic, Belorussian, Moscow, and Northern Railroads.

Finally, the third polygon includes the Tselin, Alma-Ata, and Central Asian Railroads. Between 30 and 45 percent of all the grain shipped on the Tselin Railroad will be organized along this polygon. Empty boxcars are sent to the grain-hauling railroad according to regulation quotas. A comparison of the size of the fleets of all-purpose boxcars held in reserve on the Tselin Railroad and throughout the entire network in various months shows that with a decrease in the demand for specialized all-purpose boxcars tied to a decline in the volume of grain shipments, holding some of the cars in reserve does not result in a loss of loading resources in the polygon or in the network as a whole.

In order to increase the productivity of an isolated fleet of specialized all-purpose boxcars, it is advisable to examine a list of various freight being carried and to single out the products whose shipment in specialized cars going in the return (empty) direction does not cause any damage to the commercial condition of the cars.

The resolution of these issues will make it possible to improve the organization of railroad grain shipments.

#### Commentary from an Expert

At the request of the editorial board, N. V. Filin presents a response to the issues brought out by E. Yu. Timokhin in the above article. N. V. Filin is chief of the Agricultural Freight Shipment Department and deputy chief of the Specialized Shipments Administration of the Railway Traffic Main Administration of the USSR Ministry of Railways.

The article reflects quite objectively the basic issues in organizing railroad shipments of grain. Warranted comments were made regarding the fact that the significant change in the volume of grain shipments and other agricultural products over the course of a year creates considerable problems in providing the necessary rolling stock. There is no doubt that an increase in the number of express shipments of grain would speed up delivery and improve the preservation of the cargo. In our opinion, the conclusion presented in the article that the fulfillment of "overestimated" orders for loading grain leads to a failure to meet planned shipping volumes and express shipment plans does not correspond fully to reality. This offers considerable evidence in the given case of the groundlessness of the plan for shipments called for by the dispatchers, and as a result it causes a breakdown in the plan for express shipments.

The article presents a totally fair picture of the problem involving the need to strengthen the technical equipment at complex preparation centers for boxcars at the main grain-hauling railroads, including those that serve ports. Progressive repair technology must be introduced. The impossibility of preparing all incoming boxcars for carrying grain, as a rule, does not result in opposite runs on the Tselin Railroad or at a number of other railroads, since these cars are used for carrying other cargo or they are transferred (empty) to other railroads in accordance with regulation quotas.

It is necessary to increase the responsibility of railroad directors and all other workers for forming "reserved" express trains made up of empty boxcars suitable for carrying grain. There should be more control over keeping cars in reserve, especially just before and during the period of mass agricultural shipments. Also worthy of serious attention is the proposal for reducing the monthly irregularity of grain shipments.

There is no question that, as the author writes, more persistent work needs to be done to improve the organization of unloading grain from hopper cars (grain carriers) by expanding the loading centers, introducing contemporary means of mechanization, and building new grain-receiving enterprises. The same applies to organizing the loading of cars through roof hatches and to providing centers with equipment for weighing grain during the loading process. Issues involving the comprehensive development of maritime and river ports and port railroad stations, with the aim of achieving a maximum reduction in the imbalance of their processing capacities, deserve the most serious attention.

In our opinion, a decisive factor in providing safe, prompt shipments of grain is the addition of hopper cars to the fleet that are specialized for carrying grain. There are plans to implement the author's suggestion for organizing specialized circular trains made up of boxcars for carrying grain along different polygons at the Tselin, Alma-Ata, and Central Asian Railroads.

On the whole, the author of the article posed some pressing questions and we need to work on their resolution.

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## RAIL SYSTEMS

### METHODS TO IMPROVE RAIL LIFE, NEW GRINDING MACHINE

Moscow GUDOK in Russian 10 Aug 83 p 2

[Article by V. Sechin, candidate of technical sciences; A. Vinokurov, head, production engineering department, Taldan Ballast Works and V. Sazanskiy, senior instructor, Khabarovsk Institute of Rail Transport Engineering: "Rails Should Last Longer"]

[Text] Solving the problem of making our rails last longer will be an important contribution to our national economic life. The development of wave-shaped deformations, rippling, has a strong impact upon rail life. The most effective way to deal with rail surface irregularities is to work them with a grinding train. Due to increasing traffic intensity, however, it is also becoming increasingly difficult to grind rails which have already been laid. Rail-welding trains, however, could also perform grinding operations while they do their other repairs on old rails.

Together with the Transbaykal Railroad's rail-welding train No. 37, the Khabarovsk Institute of Rail Transport Engineering's electric machine department has developed a test model of a machine for grinding rippled rails under stationary conditions.

Tests have yielded positive results and permit hope that after necessary structural modifications the machine can be used to perform stationary grinding. A. Fedorov, chief engineer of the rail-welding train, and machinist N. Ognyannik were of great assistance to the institute in its work on this project.

Now to keep new rails from rippling, we need first of all to introduce another production process into our rail rolling facilities, that is, a step in which we grind the rolling surface. This will make it possible to smooth out irregularities produced during the rolling and straightening processes. Secondly, during construction and maintenance procedures, we must forbid laying of new or old, usable rails on new or existing tracks that have not been previously ground under factory conditions, by rail-welding units or by railroad machine shops.

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## RAIL SYSTEMS

### NEW MYTISHCHI-PUSHKINO LINE UNDER CONSTRUCTION NEAR MOSCOW

Moscow GUDOK in Russian 14 Sep 83 p 1

[Article by I. Vol'skiy: "A Third Line"]

[Text] The electric railroads in the Moskovsko-Yaroslavskoye department of the capital's trunk line, one of the busiest in our rail system, can truthfully be said to be operating at record levels of intensity; they serve three of Moscow's administrative districts as well as many suburban industrial population centers. This has created the need to run still another track from Mytishchi to Pushkino. It's not a long section, only 12 kilometers, but it's a "hard nut" for the construction people. There are too many associated structures along this route.

Moscow construction units and organizations are having to relocate dozens of communications and supply lines along the new route, run several passenger tunnels under the lines at the stops and then build a couple of bridges over the Ucha and Klyaz'ma Rivers. Then in Pushkino, transport construction workers have to build a large railroad overpass tunnel. They also have to renovate all the passenger platforms and "beautify" them. Builders are putting up some 400 supports for the contact system and almost 20 kilometers of suspension supports. In a word, they've got 15 million rubles worth of work to do, and they've got to do it by December, 1985.

It's been a little over a year since construction began. Much has been done. The crew of bridge-building train No. 426 has already completed construction of a pedestrian tunnel for the Stroitel' [Construction worker] platform, and work is nearing completion on the bridge over the Ucha. Mechanized columns from Tsentro-stroymekhanizatsiya are making rapid progress toward completion of the earthen road bed from Mytishchi to Pushkino, which they plan to have completed by the 66th anniversary of the Great October. Work is proceeding at an ever-increasing pace. When the new line goes into service it will increase the throughput of the section by almost 30 per cent.

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## RAIL SYSTEMS

### LONG DELAYS IN INTRODUCING IMPROVED COUPLER DESIGN

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 12 Jun 83 p 1

[Article by A. Margovenko, mechanic, locomotive test shop, Sverdlovsk classification yard: "Where Did the Coupler Hit the Snag?"]

[Text] Everybody thinks the automatic coupler's a good one. A single loud clang when the locomotive connects with a car, and the train is securely coupled. Quickly and reliably. There's one drawback to the mechanism, however—the decoupling device leaves something to be desired. When he wants to replace or repair an automatic coupler, the mechanic has to use a chisel and hammer on it to cut through a nut, a chain and other parts. This takes up a lot of time, which will frequently delay a train.

The Sverdlovsk classification yard has to replace an average of as many as 100 automatic couplers a month. This takes a lot of trains out of service and disrupts passenger schedules.

All these difficulties, however, are by no means inevitable. Ten years ago, P. Simonov, an engineer at the Sverdlovsk passenger terminal carshop, suggested that some of the components of the automatic coupler should be sectional rather than welded components and redesigned to boot. This would make for much quicker coupling and decoupling and eliminate having to cut any metal. Simonov's proposal was recognized as an invention, confirmed by an inventor's certificate. Car and locomotive service specialists as well as the transport people were delighted: they were at last able to see a real possibility of being able to disentangle themselves from this knotty situation which had been such a problem for everyone concerned.

Senior personnel of the Sverdlovsk Railroad immediately turned to the Ministry of Railways main car administration requesting extensive testing of P. Simonov's invention. The first request yielded nothing but a categorical refusal. In response to a second request, G. Osadchuk, chief engineer of the Ministry of Railways' car main administration, formulated the refusal in somewhat milder terms: the proposal that this invention be accepted for testing with a view to practical operation was not held to be advantageous.

As it later turns out, there is another device which has been developed by ministry personnel, the industry's institute, VNIIZhT [All-Union Scientific Research Institute of Railroad Transportation], and specialists at the Ural Railroad Car Works. Attempts are being made to ram this particular device through the rail car main administration. Unfortunately, however, this innovation is far from being the ideal solution to the problem, with by no means all the work done on it, either; it is failing its tests to boot.

So the years go by, and then it looks as though a bright new day will dawn for P. Simonov's invention. The deputy chairman of the Ministry of Railroads' council on science and technology, N. Kolodyazhnyy, granted the request of senior officials of the Sverdlovsk Railroad and permitted operational testing of the new device to begin. Over a two-year period some 100 cars of different types were tested on one of the closed sections of the railroad's Serovskoye department. The extended period for which the sectional ring was tested showed that it did indeed perform well.

Now, almost 10 years later, N. Gornostyrev, chief engineer of the Sverdlovsk Railroad, once again petitions G. Osadchuk, requesting that the process of introducing this invention be accelerated. To his letter he appends a report on the operational tests of the sectional ring.

Back once again, however, comes another routine rejection from the main administration: "The administration does not consider it to be to advantage to introduce engineer P. Simonov's automatic coupler decoupling device on its rolling stock because the Ministry of Railroads' technical requirement of 1973 provides for the development and use on rolling stock of a new chainless device with a rigid connection." "A new device with a rigid connection"—this is the very same, fairly complex, device which experts from the Ministry of Railroads, the industry institute and the Ural car works have been agonizing over for a long time now, so far to no successful result.

There are not just hundreds, not just thousands, but many hundreds of thousands of cars in the Ministry of Railroads' inventory. It's going to be a long time before they can be fitted with a device which, for all practical purposes, doesn't even exist yet. It took almost three decades to change the inventory over to the automatic coupler. Are we really going to have to wait that long before our cars can be equipped with an automatic decoupler? Wouldn't it be simpler, cheaper and quicker to fit the existing device with the triflingly inexpensive sectional rings? And then let them toil away on the "perfection" of their rigid connection.

It doesn't make a whole lot of difference to us mechanics and couplers what kind of device our cars have, whether it's the rigid connector or the sectional ring. We're interested in only one thing: that whatever kind of coupler we have works reliably, that the trains run on schedule and that we don't have to go out and cut metal in sub-zero temperatures.

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## RAIL SYSTEMS

### BRIEFS

**SUBURBAN SUBWAY HOLDING YARD**--A holding yard for suburban subway cars is being built near the subway station Devyatkinno by work crews of the 308th Administration of the Trust "Sevzaptransstroy." When it is put into service, there will be noticeable improvement in weakened passenger traffic on the Leningrad--Finland division of the October Railroad. When construction is completed, on Saturdays and Sundays the electric cars will not go to the Finland station, but only to Devyatkinno, where the new subway station "Komsomol'skaya" is located. A new platform and four terminal tracks are now being built there, and support towers for the overhead power network are being set up. The transportation builders intend to complete the work of modernizing the station ahead of schedule. [By V. Petrov] [Text] [Moscow GUDOK in Russian 7 Oct 83 p 1] 7045

**CAR AND CONTAINER REPAIR**--Organization of repair of transportation equipment by the republic's industrial enterprises themselves makes it possible to increase the operating life of cars and containers and to achieve regular delivery of rolling stock. Following the example of progressive collectives in Moscow, at the plants Tbilisi Aircraft Plant imeni Dimitrov, the Caspian Cement and Slate Plant, the Poti Milling Combine and other plants specialized sections have been created for repair of rolling stock and specialized work crews have been formed. Railroad car depots and sections of the Transcaucasian Railroad have concluded 80 contracts with industrial enterprises in the republics. More than 7,000 cars and containers have been repaired by production workers since the beginning of the year. [By G. Namtalashvili] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 9 Oct 83 p 2] 7045

**RAILROAD TV MONITORS**--The "Monitor" television system is now keeping a record of freight and passenger cars traveling through the Leningrad Station on the October Railroad. It was designed by members of the student team "Nauka" at the Leningrad Institute of Railroad Transportation Engineers. Up to now a specialized worker--the "car checker"--recorded the number of cars regardless of the weather, the time of the day or the speed of passing trains. He has now been replaced by the electronic eye of a television camera. It has also taken over inspection of the rolling stock. The student research teams of the Leningrad Institute for Railroad Transportation Engineers worked on the Baykal--Amur Main Rail Line and the Baltic Railroad this year. Under supervision of their teachers they introduced original automatic and remote control systems and apparatus ensuring a smooth train traffic schedule. [Text] [Moscow GUDOK in Russian 12 Oct 83 p 2] 7045

ROLLING STOCK SHORTAGE--For many months now in succession there has been a chronic shortage of railroad cars on the Alma-Ata Railroad, whose director is K. Kobzhasarov. But not at all because the railroad has not been receiving the rolling stock it needs, but because it is making poor use of it. Even in September, a month devoted to crash unloading, dozens of cars stood idle waiting to be unloaded at the stations Alma-Ata-1 and Alma-Ata-2. There was one reason: manual labor is predominant there. The traffic organizers are also making their contribution to poor use of the cars: the cars are not properly sorted, trains are not properly made up when they go out on the road, and the cars are not grouped by destination. The losses are especially great in train repairs. Four cars are being repaired per day in mechanized preparation points. But the standard is 13. Consequently, in the first 8 months of this year more than 4,000 fewer cars have been repaired than in the same period of last year. The time cars spend out of service during repairs exceeds the allowance 1.5-fold. More than 440,000 car-hours have already been lost. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 13 Oct 83 p 3] 7045

CSO: 1829/76

## MARITIME AND RIVER FLEETS

### RIVER FLEET SHIPPING GROWTH IN 1982, PLANNED FOR 1983

Moscow RECHNOY TRANSPORT in Russian No 8, Aug 83 p 20

[Article: "Growth Figures"]

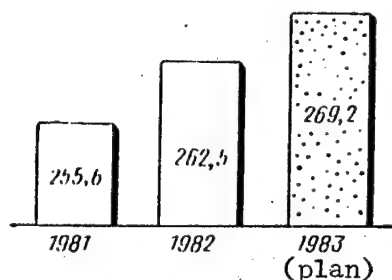
[Text] The plan for economic and social development of the river transport of the Russian Federation for 1983 has been developed and approved in accordance with the basic directions for the development of the national economy in the 11th Five-Year Plan. In comparison with 1982, freight turnover will increase by 3 percent or by 7.3 billion ton-kilometers, and the productivity of labor will increase by 2.5 percent.

As in former years, the subject for the special attention of steamship companies is shipments into the Extreme North for the enterprises of the Yakutsk ASSR and the northern regions of the Irkutsk oblast, and shipments to Arctic points, and the oil and gas regions of Western Siberia. The special attention of rivermen of the central and north-west basins is on the complete and timely hauling out of the vegetable and gourd crops from the regions of the lower Volga.

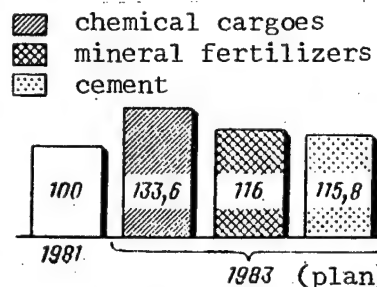
In the current year's navigation season the transport of the more labor consuming cargoes; namely, chemicals, grains, cement, timber in ships, sulphur raw material, and fertilizer will grow significantly. At the same time the shipment of mineral construction materials will be curtailed. In mixed railroad and water communications, the haulage of 54.4 million tons of freight is in prospect.

Realizing the decisions of the 26th CPSU Congress, Russian Federation rivermen, on the basis of extensive socialist emulation have completed the plan for the first half of the year in the haulage of freight and in freight turnover, in passenger transportation and passenger turnover, in transshipment work at ports, in the output of industrial products, in the exploitation of capital investments, and in placing new fixed assets into service.

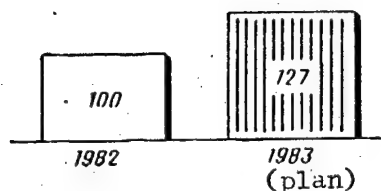
Above the plan, 12.1 million tons of national economy cargoes were transported with a cargo turnover of 4.5 billion ton-kilometers. Planned assignments were fulfilled in the transport of petroleum and petroleum products by tanker, of timber in rafts and on ships, salt, bituminous coal, granulated slags, iron ore, mineral fertilizers, exports and imports and other freight.



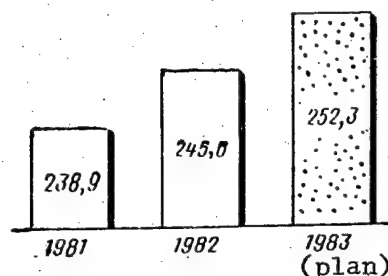
Freight Turnover of the USSR River Fleet  
(billions of ton-kilometers)



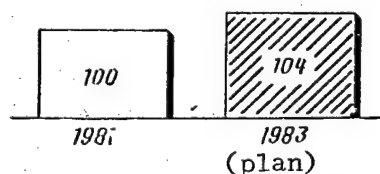
Growth of the Volume of Haulage of a Number of Important National Economy Cargoes in Percent  
(1981 = 100 percent)



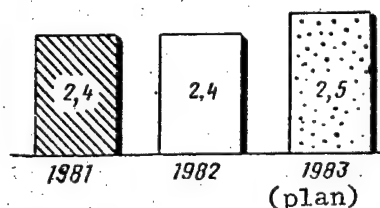
Growth of the Volume of Freight Haulage in Mixed Railroad and Water Communications in Percent  
(1982 = 100 percent)



Freight Turnover of the RSFSR River Fleet  
(billions of ton-kilometers)



Growth of the Volume of Freight Haulage in the Siberian and Far Eastern Basins in Percent  
(1981 = 100 percent)



Volume of Freight Haulage in Containers by the Fleet of the Ministry of the River Fleet  
(millions of tons)

All planned freight was delivered to the oil and gas regions of Western Siberia and to Sakhalin island and dry cargoes to Dudinka.

Seventeen steamship companies fulfilled the plan according to both indicators. The planned assignments for the gross productivity of dry cargo ships and oil tankers were achieved as were the assignments in the economic indicators of: productivity of labor and transportation costs, transshipment operations, and industrial activity. Dwelling area in the amount of 12,300 square meters above the plan was put into service.

At the expanded conference of the board of Ministers of the RSFSR River Fleet and the presidium of the Central Committee of the trade union of maritime and river fleet workers which was convened in Moscow on June 21st 1983, the problems of river fleet workers that flow from the June 1983 Plenum of the CPSU Central Committee were discussed. Specific measures for more fully satisfying the requirements of the national economy in river transport were mapped out, and the supplementary increased socialist obligations of the steamship company collectives for the transport of freight were approved.

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## MARITIME AND RIVER FLEETS

### SUCCESS OF GDR'S SHIPBUILDING ASCRIBED TO SOVIET HELP

Moscow MORSKOY FLOT in Russian No 8, Aug 83 pp 56-57

[Article by G. Makhov: " 'Merkur', 'Monzun', and Others.... (The Shipbuilding of the GDR at the Liepzig Fair)".]

[Text] Shipbuilding is one of the leading sectors of industry in the German Democratic Republic. Its successful development became possible thanks to the close cooperation of the GDR with its brother socialist countries and primarily with the Soviet Union which is the principal customer of the republic's shipbuilding industry. Since 1946 when the construction of ships for our country began at GDR shipyards, thousands of ships with a gross register tonnage of more than 4.4 million register tons have been delivered to the Soviet Union.

Soviet orders, Soviet experience, and raw materials from the USSR created a favorable basis for the development of shipbuilding in the GDR. Our country's large long-range orders permitted GDR shipyards single-mindedly to specialize on large-series production. This is the result of the development of socialist economic integration within the framework of the SEV [Council of Economic Mutual Assistance].

The shipbuilding industry of the GDR consists of 18 enterprises and organizations which are distributed primarily in the northern part of the country along the Baltic Sea coast. Among them are: the foreign trade enterprise "Shiffskomerts", the Institute of Shipbuilding, the Engineering Bureau of Shipbuilding, the maritime shipyards in Varnemyund, Rostok, Shtral'zund, Vismar, and Vol'gast, the river shipyards, and the plants which produce engines and other shipboard equipment.

Since 1946, at the shipyards of the GDR more than 4,800 ships of 160 types have been built having a total gross register tonnage of about 8 million register tons. They have been built to the orders of 40 countries including countries with a developed shipbuilding industry. Annually, right now, about 70 ships of 20 types having a gross register tonnage on the order of 400,000 register tons are coming off the republic's building ways. Ninety percent of the shipyards's production is for export. In recent years the GDR has been occupying a leading position in world shipbuilding. It has been maintaining 1st to 3rd place in the production of fishing ships and 5th to 7th place in the construction of cargo ships.



The exhibit of the Schiffbau (Shipbuilding) Combine at the 1983 Leipzig spring fair told all about this.

Unconditionally, the containership "Merkur II" can be called exhibit No. 1 at the fair. Since 1982 ships of this type have been delivered to the Soviet Union. The first ship of this type was the motorship "Kapitan Gavrilov" (see "Morskoy Flot" 1983, No. 6). With a deadweight 15,950 tons, the container capacity of the ship amounts to 938 twenty-foot units. On the upper deck 402 units are carried. The ship's main engine is a 9 DKRN 80/160-4 slow-speed diesel with a continuous rated power of 15,822 kW and of Soviet manufacture. This is another graphic example of socialist economic integration. The ship, built by the talented and industrious hands of "Varnovverf" workers in Varomyund, received the highest award at the fair - the gold medal.

Another very interesting development by "Varnovverf" is a Roll-on/Roll-off containership with a deadweight of 18,000 tons having powerful cargo-handling equipment; namely, 2 pairs of 12.5-ton cranes, 2 coupled booms with a lift capacity of 25 tons, and one 100-ton capacity heavy lift boom. In the stern part of the ship there is an angled ramp providing access to the internal cargo spaces. The ship can accommodate 529 twenty-foot containers and 89 trailers. The main engine is a K5Sz 70/125B diesel with a power of 7,600 kW at 145 rpm which was manufactured in the GDR under license from the firm "MAN - Burmeister-Wain." It provides the ship with a 17 knot speed.

At this same shipyard general-purpose cargo ships of the "Monzun" type having a deadweight of 17,240 tons and equipped for carrying containers are being built. They also have a variety of cargo-handling equipment; namely, 4 mechanized booms with 35-ton capacity, 4 booms with 5/10-ton capacity, and one with 125-ton capacity. Thanks to this "Monzun" class ships can successfully carry out cargo operations in unequipped ports. A slow-speed K7Z 70/120E diesel with a power of 6,690 kW at 130 rpm gives the ship a speed of 17 knots.

Among other specimens of "Varnovverf" products presented at the fair are the arctic bulk carriers of the "Dmitry Donskoy" class having a 19250-ton deadweight which were delivered to the USSR in 1977 and are well known to our seamen.

Ships of new types - Roll-on/Roll-off ships created at the "Neptune" shipyard in Rostok and at the shipyard imeni Matias Tezen in Vismar are attracting the attention of specialists.

The Roll-on/Roll-off ship of the "Neptune" yard has a deadweight of 4,850 t. Its distinguishing features are: an angled stern ramp and 2 cargo lifts (for 40 and 45 tons). The main engines are 2 medium-speed 6VDS 48/42-A1-2 diesels with a power of 2,648 kW at 500 rpm driving two controllable pitch propellers.

The Roll-on/Roll-off ship from Vismar is somewhat larger - its deadweight is 6,620 tons. It has a transom ramp with 8X12-meter dimensions designed for 100-ton loads, 2 cargo lifts of 53-ton capacity and 18.5X3.5 meter platforms, and a suspended platform between the double bottom and the second deck.

A feature of the design of both ships is the movement to the bow of the superstructure for the living quarters and the bridge .

The production program of GDR shipyards includes a variety of fishing and fish-processing ships. In particular at the fair, a factory-trawler was presented of the type "Atlantik-488" having autonomy of navigation of 100 days and high productivity - 26,000 cans per day.

Since 1972 Shtralzund shipyards have been building factory-trawlers of the "Atlantik-Supertrawler" class. Clients have received about 200 such ships. The very numbers testify to their quality and reputation.

Another product of the Shtral'zund shipbuilders presented at the fair was the freezer-trawler and seiner of the "Atlantik-333" class designed for various kinds of fishing and able to process 45 tons of fish a day.

Ships of all these types are widely delivered into our country.

The "heart" of every ship is the engine. Therefore, in talking about GDR shipbuilding one cannot fail to mention the engine production of the republic. Large enterprises in Rostok ("DMR"), and in Magdeburg ("SKL") are occupied with engine production. They produce slow-speed, medium-speed, and high-speed diesels of various sizes and main and auxiliary diesel generators many of which were exhibited at the fair. One engine in particular, created by the combine "SKL", must be mentioned. It is the 8VDS 24/24 AL-1 which is a new generation of medium-speed diesels.

This diesel, with a power of 1,200 kW at 1,000 rpm can be used as a ship's main engine or as the drive for a shipboard diesel generator. The ratio of the weight of the engine to its power is 9.58 kg/kW which corresponds to the level of the best specimens in the world. The engine is adapted to operate on heavy fuel having a viscosity of up to 180 mm<sup>2</sup>/sec at 50C, and the designed specific fuel consumption is 208 g/kW/hr. It can be operated without maintenance for 170 hours. Engine life between major overhauls is 50,000 hours.

Articles produced by the GDR shipbuilding industry have been awarded international diplomas and 30 gold medals at Leipzig fairs. Is this not testimony to the high quality of the products of the shipbuilders of the republic? Shipbuilding in GDR is a dynamic sector of the national economy and it is on the rise.

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## MARITIME AND RIVER FLEETS

### LEAD EDITORIAL URGES INCREASED RIVER FLEET TRANSPORT OF FOODSTUFFS

Moscow RECHNOY TRANSPORT in Russian No 8, Aug 83 pp 2-4

[Editorial: "With Concern for the Harvest"]

[Text] The Ministry of the River Fleet [Minrechflot] envisages increasing the volumes in transporting agricultural cargoes 87.3 percent against 1980 by the end of the 11th Five-Year Plan.

The list of agricultural products being transported by the rivermen is varied and includes grain, vegetables, melon crops and other agricultural cargoes. A special place is occupied by grain cargoes, whose relative share in the overall volume of shipments amounts to 88-92 percent. The greatest volume of them will be handled by the associated steamship companies in the European part of Russia. This requires that jointly with oblast cereal products administrations they organize efficient and coordinated work of all links of the transportation conveyor from the field to the consumer.

During this year's navigation season, river transportation is faced with great tasks in improving transportation service to agriculture and prompt shipment of products of the new harvest. Thus, compared with shipments in 1982, the volume of grain to be transported should increase by 34.6 percent, of mixed feed by 16.2 percent and of chemical and mineral fertilizers by 6.5 percent. On orders of consignors in Astrakhan and Volgograd Oblasts, it is necessary to transport 220,000 t of watermelons and tomatoes to the country's central and northwestern regions, which is 2.9 percent more than the actually fulfilled volumes in 1982.

The river transport's plan for economic and social development in 1983 notes that the main task of rivermen during the current navigation season is complete satisfaction of the national economy's requirements in transporting agricultural production.

From the first days of the navigation season, the collectives of steamship companies, striving to make their contribution to the implementation of the Food Program outlined by the party, have broadly expanded competition for early and quality delivery of all cargoes for agriculture, and, first of all, of fuel, fertilizers and seed grain for spring sowing.

Taking advantage of the high water period of the navigation season, the collectives of steamship companies have adopted all possible measures to ensure priority delivery of these cargoes. Special attention was devoted to spring delivery of cargoes to remote areas of the lateral and rapidly shallowing rivers--Vetluga, Unzha, upper Kama, Yug, Pinega, Pit, Chuzik, Vilyuy, Kirenga and other rivers.

The overall volume of shipments of agricultural products and cargoes for agricultural needs, which was fulfilled during the first half of this year alone, amounted to more than 15 million t, including more than 1.9 million t of various grain cargoes and 1.605 million t of chemical and mineral fertilizers, which is considerably more than was delivered in a corresponding period of last year. The fleet of the Volgotanker Steamship Company transported more than 1.38 million t of various petroleum products to riparian agricultural regions, including more than 40 percent via lateral and rapidly shallowing rivers.

The most strenuous period for river transportation is the time of mass harvesting. Therefore, in preparing for mass transportation of agricultural products the most important task of river fleet workers is realization of a large complex of organizational and technical measures, which are directed at ensuring prompt and quality delivery of the new harvest to the consumer and state granaries. One of such measures is transporting grain from southern oblasts to central and north-western regions of our country with the aim of discharging and preparing elevators and grain receiving centers for prompt acceptance of the newly harvested grain. The main role in fulfilling this task is assigned to the collectives of the Volzhskoye Unified, Volgo-Donskoye, Bel'skoye and Vyatskoye Steamship Companies. As a result of efficiently organized work, more than 900,000 t of grain was transported to places in northern and central regions of the country during the April-May period alone.

The second important measure is prompt and quality preparation of the transportation fleet. According to a decision of the collegium of the Ministry of the River Fleet, a program for performing capital repairs to cargo motorships of projects No 11, 576, 21-88, 781 and 791 so that they can be used further in grain transportation is being implemented since 1982. To ensure the increasing volumes in transportation of vegetables and melon crops, it is provided that beginning from 1983 unit capital repairs be performed on the entire small-capacity transportation fleet, both self-propelled and non-self-propelled, which is being used beyond the established service life. For hauling grain and other cereal cargoes in the 1983 navigation season, all river basins have prepared during the winter ship repair period more than 600 units of the transportation fleet with an overall carrying capacity of more than 1.2 million t, including nearly 500 self-propelled cargo ships among which are modern cargo motorships with a carrying capacity of 5,000 t each, which were equipped for this purpose. In transporting tomatoes and watermelons from places in Astrakhan and Volgograd Oblasts, 138 cargo motorships with a carrying capacity of 600-700 t each and 10 containerships are being used. Based on experience of previous years, a rapid line, which is made up of 30 motorships, catamarans and "Okskiy"-type motorships, was established for transporting tomatoes and watermelons from Astrakhan Oblast to Moscow.

Special self-propelled river vegetable-hauling vessels are used for the first time in the 1983 navigation season in transporting fruits and vegetables. There are only two of them so far, but it is planned to build 90 such vessels during the 11th Five-Year Plan.

During mass presentation of vegetables and melon crops for shipment, the Volzhskoye Unified Steamship Company is responsible for assigning additional (as needed) cargo motorships with a carrying capacity of 2,000 t and covered barges.

The entire fleet, which was planned prior to the opening of the navigation season to haul agricultural products and cargoes for agriculture, as a rule, is staffed by more experienced skilled personnel, especially by command personnel having navigational skill.

All steamship companies, which transport grain, fruits and vegetables and have a balance of cereal tonnage and small-capacity self-propelled transport fleet for hauling melon crops, should devote special attention to its timely readiness for such hauling. All malfunctions discovered in the course of the navigation season must be rapidly eliminated.

The experience of previous navigation seasons proves that organization at industrial enterprises of specialized sectors and complex brigades to repair vessels at any time of the day is of great significance for reducing the unplanned layovers of the fleet which is engaged in hauling grain, fruits, vegetables and melon crops. Such sectors and brigades, which were organized in accordance with measures confirmed by the collegium of the Ministry of the River Fleet at all large ship repair enterprises and in ports near loading centers, must efficiently fulfill the tasks assigned to them.

Along with preparing the fleet, the steamship companies and ports jointly with oblast cereal products administrations also checked the readiness of elevators and grain receiving centers. Moreover, special attention was devoted to preparing the harbor fleet, mechanical equipment and weighing facilities.

Important tasks were set before workers of technical sectors of basin routes and channels administrations. Every year they fulfill at least 1 million m<sup>3</sup> of dredging work at requests of enterprises of the agroindustrial complex. During the April-May period alone, they actually fulfilled at requests of procurement organizations more than 1.2 million m<sup>3</sup> of dredging work in cleaning up and deepening approaches to 47 docks of elevators and grain receiving centers.

During the preparation period, the steamship companies and ports have formed brigades composed of the most skilled machine operators and port workers to handle the incoming fleet with agricultural cargoes. All necessary conditions should be created for highly productive work of these collectives.

For the purpose of on-schedule movement of the fleet and acceleration of its loading and unloading, the steamship companies and major ports of the sector have created operation groups of leading specialists under the supervision of deputy chiefs for operations of steamship companies and ports. The task of supervisors of steamship companies and ports is to use these groups for efficient organization of shipments and processing of the fleet from the first days of the harvest time.

The five-year plan and measures of the ministry provide for increasing by 1985 the volume of grain hauling by river transportation to 7 million t. Calculations indicate that this is a perfectly realistic task. The relative share of the grain hauled by river transportation from regions of Northern Caucasus, the Urals, Volga and Kazakhstan to central and northwestern riparian regions

amounts to less than one-third of the overall transported volumes. All other volumes are transported directly by railway.

In order to fulfill the planned volume of shipments it is necessary to redirect the additional cargo flows of grain from the aforementioned regions from direct railway to direct waterway and direct railway-waterway with transshipment via the ports on Don and Volga. In this connection it is necessary to raise the handling capacity of riparian elevators in Rybinsk, Yaroslavl, Gorkiy, Kazan, Perm and other cities by expanding existing capacities and introducing highly productive pneumatic grain handling equipment for unloading ships.

An important condition for increasing the volume of grain shipments by river transportation is efficient and coordinated work of associated types of transportation at cargo transshipment centers. During a period of mass presentation of cereal cargoes for shipment, flour milling combines, elevators, grain bases and transshipment ports, as a rule, experience considerable difficulties in obtaining railway cars and this causes above-plan layovers of the fleet while waiting to be unloaded. Therefore, in places where the grain is transferred from ships to cars, supervisors of ports and oblast cereal products administrations jointly with workers of ports stations and railway branches must work out unified technological processes of transferring and hauling grain from elevators in such a manner so that coordinated schedules for supplying tonnage and cars are fulfilled precisely on time.

A determining factor in increasing the volumes of shipments of agricultural production is reduction of periods in processing vessels at places of their unloading and precise pace of its movement. It is indicated by analysis that the available reserves for raising the carrying capacity of the transport fleet are used far from completely. Practically in all steamship companies the shipments of agricultural products are delayed because of poor technical equipping and low productivity of technical means in unloading ships at docks of riparian elevators and grain receiving centers.

In accordance with measures on implementing the Food Program, the steamship companies are obligated to adopt all necessary measures for introducing as of 1983 at docks in the ports of Kalach, Saratov, Perm and Kazan a new technological scheme for transferring grain from river to railway transportation by using the NOYERO [not further identified] pneumatic grain handling equipment with a productivity of 150 t per hour.

Unfortunately, the majority of grain unloading centers on docks of procurement organizations are using pneumatic installations of obsolete design with a low productivity, which gives rise to a certain disproportion with overall productivity of loading docks that are equipped with more modern loading machines. Thus, the overall productivity of grain loading docks of procurement organizations of riparian centers in central northwestern basins is twice as great as the overall productivity of unloading docks.

Such disproportion as well as the low level of organization in processing grain tonnage at unloading centers results in prolonged above-plan layovers. In 1982,



the above-plan layovers of the transport fleet under unloading at docks of the RSFSR Ministry of Procurement totaled 1,584 million tonnage-days, which is equivalent to excluding from operations of 10 cargo motorships with a carrying capacity of 2,000 t each for the entire navigation season. During the past navigation season, grain tonnage was processed unsatisfactorily at docks of the Perm, Ivanovo, Yaroslavl and Gorkiy Oblast Cereal Products Administrations.

To eliminate unproductive layovers of the fleet and improve operations of the entire transportation conveyor, the RSFSR Ministry of Procurement must step up construction and modernization of its grain docks as provided for by the resolution of the CPSU Central Committee and the USSR Council of Ministers "On Measures for Developing River Transportation in 1981-85."

Great influence on increased layovers of grain tonnage is exerted by the irregularity in the rate of presentation by cereal products administrations of grain destined for the same riparian centers without taking into consideration their unloading possibilities as well as by the slow and insufficient haulage of cargo from these centers by railway transportation. As a result, the fleet crowds around and stays idle for a long time. In order to prevent the formation of such "traffic jams" the steamship companies must coordinate shipment schedules, which will eliminate the irregular arrival of products.

Layovers in transporting vegetables and melon crops are especially impermissible because of the extremely limited number of vessels. Unfortunately, they considerably exceed the established norms. Thus, 72.5 percent of ships made available for loading tomatoes and watermelons in the 1982 navigation season were processed late by procurement organizations in Astrakhan Oblast, including by docks of the RSFSR Ministry of Agriculture [Minsel'khos] and the Ministry of the Fruit and Vegetable Industry [Minplodoovoshchkhos]. The overall above-plan layovers under fruit and vegetable loading operations amounted to 403,000 tonnage-days, which is equivalent to layovers of 8 motorships with a carrying capacity of 600 t each during the entire fruit and vegetable haulage season, which could have additionally transported more than 9,000 t of products. Especially extensive above-plan layovers of the fleet under processing were allowed at docks of enterprises and organizations of the RSFSR Union of Consumers' Societies [Rospotrebsoyuz] (205,00 tonnage-days), the RSFSR Ministry of the Fruit and Vegetable Industry (135,000 tonnage-days) and the RSFSR Ministry of Agriculture (48,000 tonnage-days).

The main reasons of above-norm layovers of the fleet are lack of specialized mechanized loading docks, low level in the organization of labor and performance of loading operations only during daytime. Thirty of the 45 fruit and vegetable shipment centers in Astrakhan Oblast are equipped with dilapidated wooden piers which are outfitted with belt conveyers of obsolete design. Only at two centers (Biryuchki and Olya) the shipment of agricultural products is conducted on modern docks, which have vertical dock walls with harbor portal cranes. The five similar modern docks which were recently constructed in Bakhtemir, Zavolzhye, Krasnyy Yar, Stupino and the Kilinchinskiy sovkhos have not been equipped with mechanisms at all.

It is unfortunate that in constructing these docks no provision was made to supply electric energy, which excludes the installation of portal cranes on them.

Therefore, owners of the docks are forced to rent truck and floating cranes from other organizations and the Astrakhan port, diverting them sometimes from work of no lesser importance.

Construction of docks at large shipment centers in Kopanovka, Volodarovka and Zelenga is being put off without justification. Moreover, while in Kopanovka the construction of the dock has dragged on for more than 3 years, it is unknown when it will begin in Volodarovka and Zelenga. A similar situation exists in construction of docks in the Zelenginskiy, Chernoyarskiy, Nikol'skiy and Semibugrinskiy sovkhoses. The RSFSR Union of Consumers' Societies and the RSFSR Ministry of the Fruit and Vegetable Industry must accelerate construction and commissioning of mechanized docks with container areas for loading vegetables and melon crops in ships in Astrakhan and Volgograd Oblasts.

Presentation of fruits and vegetables for shipment, as a rule, begins during the first 10 days of July and the volumes of fruits and vegetables being shipped gradually increase as they begin to ripen. The shipments reach greatest intensity in August, when the average daily presentation of vegetables reach 4,000 t and more. By this time the entire small-capacity fleet which is assigned to transport fruits and vegetable is completely occupied and vessels with larger carrying capacity have to be assigned loading work. Moreover, the amount of cargo hauled by this type of fleet as the overall haulage increases does not only drop but even increases in some years. Thus, 98,000 t (46.6 percent) of all fruits and vegetables were transported in vessels of higher carrying capacity (more than 700 t) in 1982 against 88,000 tons during the 1981 navigation season. It must be noted that these vessels (mostly catamarans, "Oks kly"-type motorships and containerships) are modern vessels, economically efficient, convenient for performing wide front loading and unloading operations and possess high speed. The use of modern motorships in hauling fruits and vegetables, especially of the catamaran type, has made it possible to reduce the delivery periods of these perishable cargoes by 2 days and, consequently, to raise the quality of shipments.

However, Astrakhan procurement organizations regard enlisting this modern high-speed fleet without any particular enthusiasm because they must prepare an increased batch of cargo in advance and significantly reorganize the transportation process from the field to the consumer. Moreover, in some cases it is necessary to modernize existing and construct new mechanized docks and to organize round-the-clock shipment of fruits and vegetables on them, and most importantly to solve the question of shipping fruits and vegetables in containers. With the aim of completely ensuring the ever-increasing volumes of shipments with guaranteed preservation of products, the shippers must solve all these questions without delay.

Extensive losses in the fleet's carrying capacity are caused by the indifferent attitude of the shippers toward fulfilling the established technical conditions of loading. Thus, 364 vessels or 55.8 percent of the entire fleet which was made available in Astrakhan Oblast, were dispatched underloaded in 1982. The overall shortfall amounted to 29,000 t to haul which during the vegetable season



it was necessary to additionally assign more than 100 motorships with a carrying capacity of 600-700 t each. Because the number of small-capacity vessels used for hauling fruits and vegetables is limited, the steamship company was forced to assign motorships with a carrying capacity of 2,000 t each to haul this cargo by taking them away from transporting other national economic cargo, even including the grain. Workers of the Astrakhan port must raise their demands on the shippers as regards fulfillment of technical conditions in loading vessels with fruits and vegetables.

Unloading of tomatoes and watermelons from ships was conducted especially unsatisfactorily in Perm, Cheboksary, Kazan, Leningrad and Ufa. During the 1982 navigation season, the above-plan layovers of the fleet in unloading fruits and vegetables as a whole amounted to 342,000 tonnage-days, which is equal to excluding from operations for the entire vegetable season of 7 cargo motorships with a carrying capacity of 600-700 t. These vessels could have additionally transported 8,000 t of products.

Supervisors of steamship companies and ports are obliged to implement the outlined measures aimed at preventing layovers of vessels at docks of arrival and achieve that consignees efficiently organize their unloading as well as hauling perishable products from the docks.

The analysis of fleet utilization in transporting tomatoes and watermelons during the 1982 navigation season indicates that by eliminating above-norm layovers at loading and unloading points as well as shortfalls of the fleet it is possible to additionally transport 45,000 t of cargo with the same number of vessels. This is a substantial reserve and efforts of rivermen and procurement workers must be directed toward its realization.

One of the basic ways for increasing the volume of shipments of fruits and vegetables is by shipping them in containers.

Currently only watermelons are shipped in containers. During the past navigation season, 77.3 percent of all watermelons from places in Astrakhan and Volgograd Oblasts were shipped in containers. The main reasons holding back introduction of containers in transportation of fruits and vegetables is the absence of specialized docks with container areas and corresponding mechanisms, not enough containers for transporting watermelons and complete lack of them for transporting tomatoes.

The RSFSR Union of Consumers' Societies and the RSFSR Ministry of the Fruit and Vegetable Industry should implement measures aimed at switching over all bulk shipments of watermelons to shipping in containers and solve the question of shipping tomatoes in containers

The organization of transportation of agricultural cargoes by river transportation also depends to a great extent on the work of rivermen themselves. The attention of supervisors of steamship companies and ports must be directed at daily control over prompt presentation of the fleet and quality delivery of agricultural products to industrial centers. The steamship companies and ports

must render necessary assistance to shippers and consignees in introducing progressive technology of loading and unloading work and in promptly allocating floating transshipping equipment. All conditions for accelerated processing should be created for vessels arriving with agricultural products.

The Volzhskoye Unified Steamship Company and the Astrakhan and Volgograd ports jointly with shippers should raise the quality in operations planning of shipping tomatoes and watermelons. Shortcomings in joint work were noted during the 1982 navigation season. Thus, based on the total of 10-day requests shippers in Astrakhan Oblast requested 801 vessels for loading watermelons and tomatoes and 669 vessels were confirmed by daily verified requests but only 650 vessels were received for loading. More than 20 vessels, which were moved to loading docks in accordance with the requests, were not accepted for loading by shippers themselves and as a result had unproductive layovers and empty runs.

Coordinated actions of shippers and rivermen and mutual responsibility for fulfilling their own pledges would make it possible to use additional reserves for increasing the carrying capacity of the fleet.

An important role in organizing haulage of the new harvest belongs to the dispatcher service of steamship companies and ports. Efforts of operation workers must be directed toward one goal--ensuring efficient work of all links of the transportation conveyor through high quality of 10-day and daily planning of fleet and port operations on the basis of strict fulfillment of the traffic schedule and ship processing norms.

Great significance is acquired by competition of collectives of transport ships and dispatching ports for accelerating fleet processing and finding reserves for improving its use.

In coordinating the work of the dispatcher staff of associated steamship companies in central and northwestern basins in organizing efficient fleet operations in transporting agricultural cargoes a not unimportant role must be played by the interbasin shipments service. During the entire course of the navigation season, workers of this service should exercise constant control over the fleet's location, which is engaged in hauling grain, fruits and vegetables, coordinate its rational distribution among loading areas and keep watch over fulfillment of processing and movement norms.

By realizing the overall importance of the tasks facing river transportation in transporting agricultural products and actively participating in solving them, rivermen of the Russian Federation are making their worthy contribution to fulfilling the Food Program outlined by the party.

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## MARITIME AND RIVER FLEETS

### BRIEFS

**PADDLE-WHEEL RIVER VESSEL**--A paddle-wheel motor vessel has been launched on the northern Lena River not far from Yakutsk. It was designed by specialists of the design office of an administration of the Lena Shipping Company. Why did they need to revive the old idea? It was imposed by specific local conditions. The small rivers of the Far North are shallow, they do not allow present-day motor vessels with screws and deep draft to reach the remote sub-arctic regions. That is why the priority cargo is being carried there mainly by airplane and helicopter, which is very expensive for the state. That is why an economical tugboat was needed. The new ship, built at the Zhatay Ship Repair and Building Yard, is adapted for navigation on all the blue highways in northern latitudes. It is capable of developing a speed of 18 km/hr. It has high maneuverability: when the paddles are turned in opposite directions, it can make a turn practically in place. But the main thing is that it is submerged only 1 meter into the water. Consequently, when leading a string of barges it can simply tie up to a shore which has not been equipped with special docks. [By V. Nikolayev] [Text] [Moscow TRUD in Russian 27 Sep 83 p 4] 7045

**NEW DRY CARGO VESSEL**--The Soviet flag has been raised over a new vessel built by Varna shipbuilders. This is the type of vessel of a new series of dry cargo ships intended for the Soviet Union; it has a cargo capacity of 25,000 tons and is furnished with the most up-to-date navigation equipment. Bulgarian shipbuilding is developing at a fast pace today and possesses an impressive scientific-technical potential. More than 100 designs of ships of various kinds have been developed in Bulgaria. [Text] [Moscow VODNYI TRANSPORT in Russian 7 Oct 83 p 1] 7045

**FINLAND DELIVERS NEW TANKER**--The new tanker "Ventpils," built in Finland on our country's order, has gone into service. This is the type of vessel of a new series of specialized ice-strengthened motor vessels intended for navigation in ice. The "Ventpils" can carry not only petroleum products, but also chemicals, indeed four types at the same time. [By V. Lushchevskiy] [Text] [Moscow VODNYI TRANSPORT in Russian 18 Oct 83 p 1] 7045

**LAST CONVOY LEAVES DUDINKA**--The last convoy of river vessels yesterday left the largest Arctic port Dudinka, which is covered with ice like a coat of armor. The summer navigation season has come to an end in the lower reaches of the Yenisey. The rivermen of the Yenisey Shipping Company have succeeded

in delivering thousands of tons of cargo to the Taymyr. [Text] [Moscow VODNYY TRANSPORT in Russian 18 Oct 83 p 1] 7045

NEW VESSEL FOR SAKHALIN--The fleet of the Sakhalin Maritime Shipping Company has been enlarged by the motor vessel "XIX S'yezd VLKSM," built by Leningrad shipbuilders. The vessel possesses more powerful equipment than previous models. The capacity of the cargo compartments has also been increased by lengthening the hull. The motor vessel's crew shortened the port time required for preventive inspection and sailed on its first working cruise to Magadan ahead of schedule. [Text] [Moscow VODNYY TRANSPORT in Russian 20 Oct 83 p 4] 7045

LARGE NEW NORTHERN FREIGHTERS--Two new large-tonnage ice-strengthened dry cargo vessels of the Murmansk Shipping Company, named after ancient Russian ports of the north, are making their first trips. The motor vessel "Arkhangelsk" has carried to Novyy Port equipment intended for the economy of Siberia. The crew then took to Dudinka products of the Norilsk Mining and Metallurgical Combine intended for enterprises of the Koli Peninsula. Continuing its cruise in the Arctic, the "Arkhangelsk" delivered varied cargo to Pevek, and it is now returning westward. The bulk-carrier "Kola" has completed its first trip to Antwerp. This year the motor vessel turned out to be the thousandth Soviet merchant vessel dropping anchor in Belgium's main port. Soviet diplomats, representatives of USSR trade delegations, local authorities, and Antwerp's business and maritime circles took part in the ceremonies dedicated to this event. The sailors of the "Kola" have delivered from western Europe a large shipment of large-diameter pipe. Then setting its course for the western sector of the Northern Seaway, the vessel visited Dudinka. [By B. Georgiyev] [Text] [Moscow VODNYY TRANSPORT in Russian 20 Oct 83 p 4] 7045

BELAYA RIVER STRAIGHTENED--The route of vessels on the Belaya River has been shortened by 10 km. In its middle reaches two regulating canals have been built which make shipping here safer. This will make it possible to substantially increase the volume of cargo that can be carried on the river. [Text] [Moscow VODNYY TRANSPORT in Russian 22 Oct 83 p 1] 7045

NEW BAKU TANKER--The new tanker "Ivan Zemlukhov" has completed its running trials successfully. Its home port is Baku, but it was built by the Volgograd Shipyard. The tanker is capable of navigation both on seas and rivers. It has a shallow draft, and its collapsible masts make it possible to pass under bridges. Volgograd designers worked out the design of the vessels in this series. All the processes of running the vessel have been mechanized and automated. [By V. Kornev, special correspondent for PRAVDA] [Text] [Moscow PRAVDA in Russian 12 Oct 83 p 1] 7045

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## PORTS AND TRANSSHIPMENT CENTERS

### BRIEFS

ILICHEVSK--VARNA SEA FERRY--The pace of operation of the international Ilichevsk--Varna sea ferry has speeded up. Yesterday Soviet specialists unloaded and loaded the motor vessel "Geroi Shipki" in 7 hours instead of the 11 allowed. This is the highest labor productivity achieved since the complex was put into operation. Technical cooperation and international competition among transportation workers of the USSR and Bulgaria contributed to this intensification of the transportation process. [Text] [Moscow TRUD in Russian 24 Sep 83 p 1] 7045

KOMSOMOLSK-NA-AMURE QUAY--A 300-meter quay, the principal structure of the river cargo port under construction, has been put into service at Komsomolsk-na-Amure. Bottom dredging operations are now full under way, and crane tracks are being laid. Power plants and a piece-cargo warehouse are being built, and buildings have been erected for workshops, a boilerroom and a dining room. The new port will be connected by rail to the eastern section of the Baykal--Amur Main Rail Line. [By G. Vedernikov] [Text] [Moscow VODNYI TRANSPORT in Russian 7 Oct 83 p 1] 7045

CONTAINER REPAIR FACILITY--A large repair complex which yesterday went into operation in the maritime port of Leningrad will help to put back in circulation damaged large containers. It has automated equipment for hydraulic and mechanical cleaning of the large "boxes," for welding and painting operations, and for waterproofing tests. The complex is designed to repair 5,000 containers a year. [Text] [Moscow VODNYI TRANSPORT in Russian 11 Oct 83 p 1] 7045

INDEPENDENT COMPLEXES ACCEPTED--A state commission has accepted for operation an independent complex at the Nadym River Port. With addition of the new capacity, mechanized quayage has increased by 175 running meters. At the same time the commission signed the document to accept an independent complex completed in the port of Urengoy: 150 meters of quayage, two cranes and other facilities. [Text] [Moscow VODNYI TRANSPORT in Russian 15 Oct 83 p 1] 7045

VENTSPILS PORT INDUSTRY--Construction workers have undertaken construction of the third phase of the industrial plant in the port of Ventspils. The enterprise is already supplying the country's northwestern region with mixed liquid fertilizers and is shipping from its docks methanol, ammonia and other valuable chemical products for export. When the new production complex goes

into operation, the plant's shipping capabilities will double. [Text] [Moscow VODNYI TRANSPORT in Russian 15 Oct 83 p 1] 7045

CRANE BRAKES REDESIGNED--The cylinder in the hydraulic system for braking the slewing mechanism often breaks down in operation of "Ganz 16/27.5" cranes. Then it has to be repaired, which involves replacing the seal and "prokachka" in the cylinder. An innovator has suggested altering the braking system (whose design is quite simple), which has made it possible to avoid operating the slewing mechanism in the countercurrent mode and thereby to prevent the expensive electric motors from breaking down. [Text] [Moscow VODNYI TRANSPORT in Russian 15 Oct 83 p 3] 7045

PNEUMATIC CONVEYOR--A pneumatic conveyor has been manufactured and introduced in the Dnepropetrovsk River Port according to design documentation of the Dnepropetrovsk Metallurgical Institute. It is intended for removing remnants of loose cargoes from gondola cars after they have been unloaded. It does this with its cleaning attachment, which is lowered into the gondola car by a hoisting device installed on the frame of the machine. The machine's capacity in the cleaning operation is 20-25 gondola cars per hour. It improves considerably the efficiency and quality of cleaning and also raises labor productivity in this operation. [Text] [Moscow VODNYI TRANSPORT in Russian 15 Oct 83 p 3] 7045

SYMPOSIUM IN GDANSK--The problems of applying progressive cargo-handling technology in maritime transport has been discussed by participants in an international symposium which has come to an end in Gdansk. Specialists from Bulgaria, the GDR, Poland, the Soviet Union and Czechoslovakia took part in it. About 30 papers were presented on problems of improving the organization of work and on modernization of port and maritime management using the advances of scientific-technical progress. [Text] [Moscow VODNYI TRANSPORT in Russian 22 Oct 83 p 1] 7045

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## EXPERIMENTAL SYSTEMS

### INSTITUTE DIRECTOR ON FUTURE OF PNEUMATIC PIPELINE CONTAINER TRANSPORT

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 12 Aug 83 p 2

[Article by Yu. Khatuntsev, director, Uralgiproshakht Institute, and O. Vityazev, chief design engineer: "Here It Is, the Transportation of the Future, under the heading, "An Expert's Opinion"]

[Text] Continued increases in production are going to be directly related to increases in transportation volumes. The rail transport system is going to have to absorb a substantial portion of these increases. The November (1982) CPSU Central Committee plenum subjected the functioning of this sector of our economy to justifiably critical analysis. The state is allocating substantial sums of money to modernize both the railroads and the terminals and other facilities involved in moving the country's freight.

Irregularities in the functioning of the rail transport system are being felt particularly acutely in such major industrial rayons as the Northern Urals. It has come to the point where almost all freight in the Northern Urals moves by rail. A number of the sections of these rail lines take the form of production links between neighboring extraction and processing enterprises, a situation which seriously complicates the problem of transporting other essential industrial cargoes. And we know that it costs twice as much to move freight by rail 200 kilometers than it does to transport it at least the network average distance. Now when we cut this to 100 kilometers the cost triples, while a 50-kilometer haul quintuples the figure. The country's railroads are now carrying one-fourth of all their cargoes no farther than 100 kilometers.

These figures show how very important it is that we determine upon some economical modes of transportation which we should assign to take over some of the short-haul duties the railroads are now performing. One of these modes, in our view, is the pneumatic containerized pipeline transportation system, which has already been referred to as the "transport of the future."

Together with Moscow's Transprogress special design bureau, our institute has developed the design for the Ural-1, a containerized pneumatic transport system intended for operations in the Urals and designed to carry 2.8 million tons of rock 63 kilometers.

The system consists of two parallel pipes 1220 millimeters in diameter. One of them will carry the loaded containers, the other the empties making their return

runs. Trains comprising 14 connected containers and three pneumatic engines [pnevmoveozy] will be moved by a current of air generated by a system of blowers. The whole train will weight 73 tons and move at speeds of 40-50 kilometers per hour. The Ural system is several times more efficient than motor vehicle transport, consuming energy at rates of 0.5-0.8 kWh per ton-kilometer.

Containerized pneumatic transport systems will free human beings from a variety of forms of fatiguing manual labor; it is safe and noiseless, does not harm the environment and can operate under any climatic conditions, even with temperatures fluctuating between -40 and +40 degrees.

In the course of work on the development of an integrated program of transportation for the oblast we have identified roughly ten permanent lines of connection along which systems of containerized pneumatic transportation could be employed to carry sand, rock and other bulk construction-material cargoes at rates of 15-20 million tons a year.

Basic Directions for the Economic and Social Development of the USSR for 1981-1985 and the Period Extending to 1990 call for the acceleration of efforts to introduce containerized pneumatic transport in the mining industry and enterprises in the construction materials industry. Accomplishment of this task will also depend to a substantial degree upon our planners and designers, who in their plans are going to have make more extensive use of this new mode of transportation for the movement of bulk cargoes.

In our view, one of the first steps toward the integrated introduction of a containerized pneumatic transport system for Sverdlovsk Oblast as well as other regions should be to develop a general development plan covering a period of at least 15 years. We need engineering economic computations establishing the advantage of developing these containerized pneumatic transport systems as well as how much they're going to cost and how long it's going to take to build them. This should form the basis for future planning, design and construction of pneumatic transportation.

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## EXPERIMENTAL SYSTEMS

### VARIOUS APPLICATIONS OF PNEUMATIC PIPELINE TRANSPORT

Riga SOVETSKAYA MOLODEZH' in Russian 22 Jul 83 p 2

[Article by Novosti Press Agency correspondent A. Komrakov: "Express Lines of the Future"]

[Text] A train of comprising several cylindrical container cars "pushed" by a current of air moves along large-diameter tubes at speeds of 40-50 miles per hour.

"This is the land transport of the future," says Yuriy Tsimbler, chief engineer of the Transprogress special design bureau. "Only you don't have to think of a diesel engine with a mast and sails. It's a lot simpler than that: the train itself will be the sail."

What he's talking about is a pneumatic container transport system, one of the promising future modes of transporting both freight and passengers and one in which the experts are investing a great deal of hope. What are referred to as "pnevmovozy" [pneumatic engines] play the role of the locomotive in this case, those same containers, only fitted with rubber collars and capron brushes. They turn the train into a piston: air forced into the tube exert a force against it, and it moves as if under sail.

"Out little 'charge'," Yu. Tsimbler continues, "is so far 'taking work away' only from our motor transport vehicles. I'll give you an example. To deliver gravel even the short distance from a quarry to a processing plant requires a large number of dump trucks, which have to stand idle for long periods of time to be loaded and then burn up gasoline on their empty return runs. But now in Georgia, not far from Tbilisi, a pneumatic transport system called 'Lilo' is handling this task. In less than half an hour, a train of eight cars under 0.06 atm air pressure carries 40 tons of rock and gravel from a quarry to a cement plant located 17 kilometers away. Overall, it takes two minutes to load and unload it. Introduction of the 'Lilo' system into production operations here has made it possible to increase labor productivity 20-fold over the figure achieved with motor vehicle transport!"

Construction is now under way in the Georgian settlement of Shulaveri of the third phase of the "Lilo" system; it will be 40 kilometers long and transport 2 million tons of rock a year. It will free up hundreds of workers and dozens of the large, high-capacity dump trucks.

Still another sphere in which pneumatic containers are successfully replacing the truck is municipal services. The idea of transporting domestic waste by tube is finding realization in one of the new rayons of Moscow—Chertanovo-Severnoye. A small pneumatic removal station has been built at the edge of the housing development. Tubes to which powerful compressors, which "push" waste to the station's collectors, have been connected run from the residential buildings to the station. Here the waste is compacted and burned in solid form.

Construction is nearing completion in Leningrad on the first phase of a domestic waste-collecting system, which will combine a pneumatic containerized transport system with a vacuum facility. Calculations have shown that the introduction of this system will make it possible to "free up" as many as 100 trucks. So the pneumatic system will save fuel and introduce a high level of automation to a job which has always been considered undesirable.

Pneumatic systems have also found application in many of the country's industrial enterprises, in the Saransk machinery works and the Penza machine-building plant. The systems here aren't all that big, perhaps, but they can deliver small components from a shop to the finished-production warehouse and "carry" a unit to an assembly shop. Introduction of these systems has already proven to have been to great advantage, even if we look only at the substantial reductions in manual labor they have made possible.

The pneumatic container for libraries represents still another sphere of application. Here we see different tasks and, accordingly, different technical solutions. Instead of round tubes, Transprogress specialists have employed rectangular tubes in this instance. The container reminds you of the student's back pack, so it can transport books more conveniently. This new system is going to be put into operation in the Lenin Library in Moscow and the Saltykov-Shchedrin Library in Leningrad. Each system will deliver to library users as many as 5 million books a year. The idea of a pneumatic subway now beckons enticingly.

Just imagine—a transparent plastic tube suspended on openwork supports. Inside you can see the glass and aluminum cars slipping silently by. Reliable sealing and air conditioning create a comfortable environment for passengers. Air will be doing all the work, so there won't be any engine noise or air pollution.

Computations have shown that it would cost half as much to build pneumatic urban transportation systems as it would to build subways. Operating costs would also be cut in half.

The pneumatic subway is in the future of our cities. And the not too distant future at that. A pneumatic passenger transport system has already been designed which will connect the Moscow suburb of Zelenograd with the capital.

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